Ultramar

Ultramar Inc.
P.O. Box 466
525 W. Third Street
Hanford, CA 93232-0466
(209) 582-0241

91 APR 29 AM 11:17

Telecopy: 209-584-6113 Credit & Wholesale
209-583-3330 Administrative
209-583-3302 Information Services
209-583-3358 Accounting

April 25, 1991

Ms. Pamela Evans
Hazardous Materials Program
Department of Environmental Health
Alameda County Health Care Services
80 Swan Way, Room 200
Oakland, CA 94612

SUBJECT: BEACON STATION NO. 721, 44 LEWELLING BLVD., SAN LORENZO, CALIFORNIA

Dear Ms. Evans:

Enclosed is a copy of the First Quarter 1991 Monitoring Results for the above-referenced Ultramar facility prepared by Groundwater Technology, Inc.

Ultramar is continuing the assessment of this site and a work plan was submitted to your office on March 14, 1991. Ultramar is awaiting regulatory comments on that work plan before continuing. The site is also undergoing interim remediation consisting of manual bailing of the wells containing free product. First quarter data indicates that free product has been reduced to below measurable thickness in one well and by approximately 40% in the other well.

Please call if you have any questions regarding the information included in this report.

Sincerely,

ULTRAMAR INC.

Terrence A. Fox

Terrence A. Fox
Environmental Specialist II

Enclosure: First Quarter 1991 Monitoring Results

cc w/encl: Mr. Steven Ritchie, San Francisco Bay Region, RWQCB

GROUNDWATER TECHNOLOGY, INC.

1401 Halyard Drive, Suite 140, West Sacramento, CA 95691, (916) 372-4700
FAX (916) 372-8781

April 20, 1991

Refer: 202/899-7072
02320 1009

Mr. Terrence A. Fox
Environmental Specialist
Ultramar, Inc.
525 West Third Street
Hanford, CA 93230

SUBJECT: FIRST QUARTER 1991 MONITORING RESULTS
BEACON STATION #721
44 LEWELLING BOULEVARD
SAN LORENZO, CALIFORNIA

Dear Mr. Fox:

In accordance with your Task Order No. 721-11-0000-C dated February 5, 1991, Groundwater Technology, Inc. completed the first quarter 1991 groundwater monitoring at the subject site on March 28, 1991. The methods and results of the monitoring are documented below. A Site Location Map and a Site Plan are attached as **Figure 1** and **Figure 2**, respectively.

Monitoring Well Gauging

Prior to well purging and water sample collection on March 28, 1991, Groundwater Technology personnel gauged all accessible site-related monitoring wells to determine the depth to water and the depth to separate-phase petroleum, if present. The well gauging was conducted in accordance with the attached Standard Operating Procedure (SOP). A Well Monitoring Form which converts the gauging data to water table elevations is also attached. The water table elevations for March 28, 1991 were used to prepare the Potentiometric Surface Map presented as **Figure 3**.

Monitoring Well Sampling

Subsequent to well gauging on March 28, 1991, water quality samples were collected from monitoring wells MW-1, MW-2 and MW-4 through MW-9 in accordance with the attached SOP. A water sample was not collected from MW-3 due to the presence of separate-phase petroleum hydrocarbons in the well. The samples were submitted under a chain-of-custody to Applied Analytical Environmental Laboratories in Fremont, California. Each water sample was analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), and total petroleum hydrocarbons as gasoline (TPH-G) by EPA-approved Methods 5030 and 8015/8020. A summary of the analytical data is presented as **Table 1**. The analytical laboratory reports are attached. The dissolved benzene concentration measured in each monitoring well is depicted on the Dissolved Benzene Concentration Map presented as **Figure 4**.

Discussion

The potentiometric surface elevation in the site-related groundwater monitoring wells has risen an average of 3.4 feet since the last quarterly monitoring conducted on December 18, 1990. The apparent separate-phase petroleum thickness has decreased from 0.4 feet to a sheen in MW-1 and from 0.42 feet to 0.25 feet in MW-3. Dissolved hydrocarbon concentrations are consistent with the fourth quarter 1990 data.

Groundwater Technology appreciates the opportunity to conduct this work. Please contact Groundwater Technology's West Sacramento office if you have any questions or if we can be of further service on this project.

Sincerely,

GROUNDWATER TECHNOLOGY, INC.

Robert H. Bird

ROBERT H. BIRD
Senior Scientist
Project Manager

E K S

E. K. SIMONIS
California Registered
Geologist, No. 4422

REGISTERED GEOLOGIST
EDWARDAS (ED) K. SIMONIS
No. 4422
STATE OF CALIFORNIA

RHB/EKS:rc

Attachments

TABLE 1

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

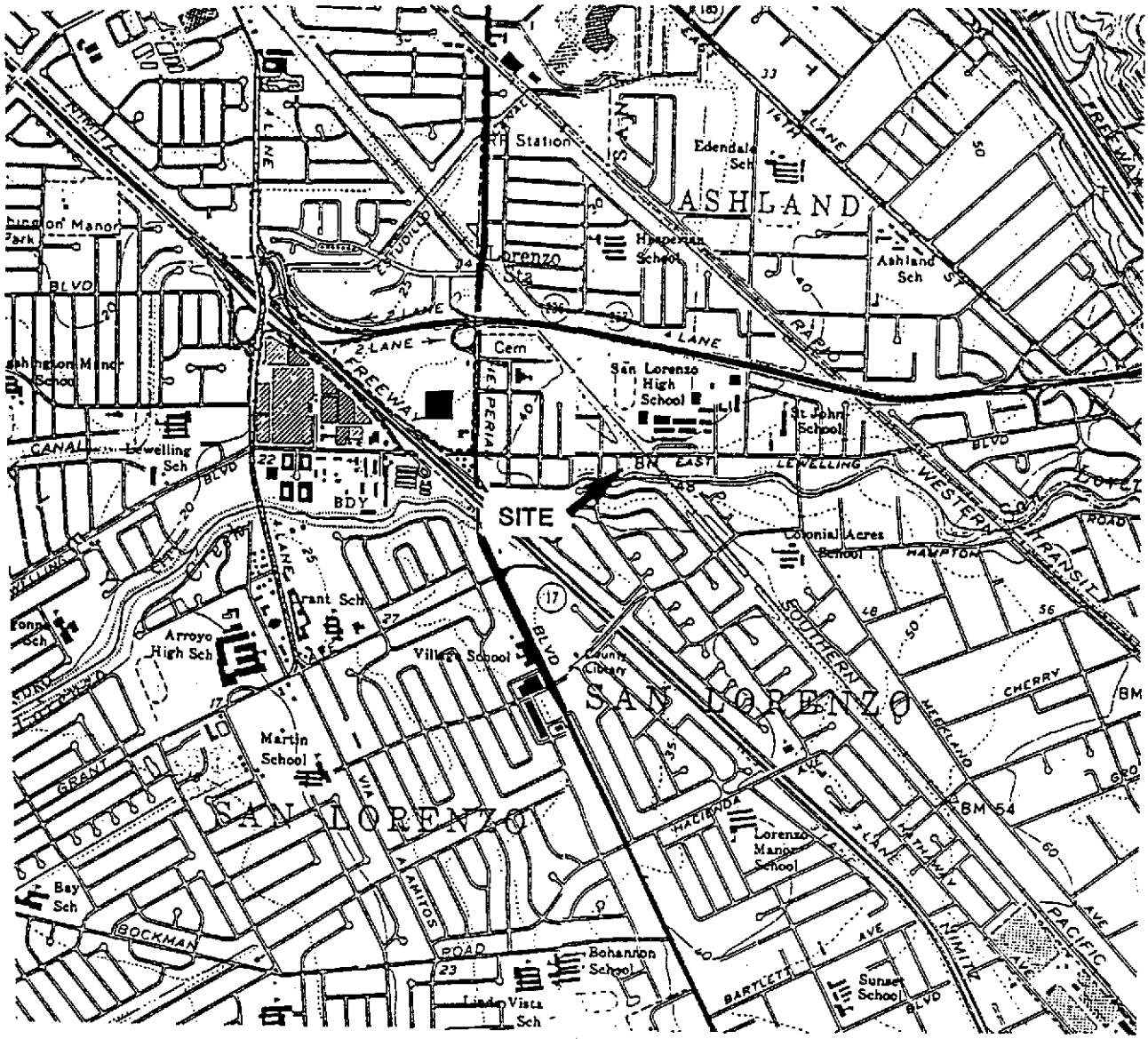
BEACON STATION NO. 721
44 LEWELLING BOULEVARD
SAN LORENZO, CALIFORNIA

WELL ID	DATE SAMPLED	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYLBENZENE (ug/L)	XYLENES (ug/L)	TPH-G (ug/L)	COMMENTS
MW-1	29-MAY-87	490	150	930	3790	18050	
	14-JUL-87	560	120	950	3270	14750	
	17-AUG-87	630	40	320	1130	12860	
	01-SEP-87	558	84	562	1942	14269	
	10-DEC-87	200	138	273	777	14000	
	10-MAR-88	70	40	340	940	7300	
	14-JUN-88	290	ND(10)	330	790	34000	
	05-DEC-88	100	16	140	310	4000	
	08-MAR-89	670	20	580	1200	9100	Odor, Sheen
	22-JUN-89	1000	20	1200	2200	12000	Odor, Sheen
	27-SEP-89	960	9	260	360	6800	Odor
	29-DEC-89	210	33	1200	250	4800	
	29-MAR-90	1100	42	510	1800	14000	Odor
	21-JUN-90	1400	ND(30)	160	130	7900	
	25-SEP-90	NS	NS	NS	NS	NS	0.9' Free-Product
	18-DEC-90	NS	NS	NS	NS	NS	0.4' Free-Product
	28-MAR-91	230	75	570	2000	25000	Sheen
MW-2	29-MAY-87	113	14	46	58	4870	
	14-JUL-87	103	25	34	48	2207	
	17-AUG-87	37.6	10.9	8.2	11.1	756	
	01-SEP-87	75.3	14.2	16.4	27.6	1482.5	
	10-DEC-87	28	40.6	38.1	100.3	1800	
	10-MAR-88	9.2	3.1	7.3	2.6	1200	
	14-JUN-88	ND(0.9)	ND(1.0)	2.2	5.7	500	
	05-DEC-88	ND(0.3)	1.3	5.6	3.6	500	
	08-MAR-89	ND(1.0)	1.3	3.5	3.7	730	
	22-JUN-89	ND(0.4)	ND(0.4)	ND(0.5)	ND(0.8)	570	
	27-SEP-89	3.8	0.64	2.9	54	420	
	29-DEC-89	6.7	2.0	5.7	2.9	270	
	29-MAR-90	10	0.88	10	3.3	420	
	21-JUN-90	ND(1)	ND(1)	4	ND(4)	650	
	25-SEP-90	ND(0.5)	1.5	3.5	1.5	680	
	18-DEC-90	ND(0.5)	1.7	2.2	0.6	500	
	28-MAR-91	ND(0.5)	2.2	2.7	1.1	730	

WELL ID	DATE SAMPLED	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYLBENZENE (ug/L)	XYLENES (ug/L)	TPH-G (ug/L)	COMMENTS
MW-3	29-MAY-87	5400	3900	1700	5200	40300	
	14-JUL-87	6880	7080	1580	4770	30320	
	17-AUG-87	5930	4180	1240	3370	25620	
	01-SEP-87	8540	6660	1020	3740	38210	
	10-DEC-87	4240	2350	890	1860	25000	
	10-MAR-88	3210	950	940	950	13400	
	14-JUN-88	5900	7600	450	4600	54000	
	05-DEC-88	4200	2400	1000	3100	19000	Odor
	08-MAR-89	11000	9400	2300	9900	53000	Odor, Sheen
	22-JUN-89	16000	5900	2100	6600	60000	Odor, Sheen
	27-SEP-89	8100	2800	1200	4300	34000	Odor
	29-DEC-89	NS	NS	NS	NS	NS	0.02' Free Product
	29-MAR-90	NS	NS	NS	NS	NS	0.04' Free Product
	21-JUN-90	19000	22000	22000	120000	2100000	
	25-SEP-90	NS	NS	NS	NS	NS	0.04' Free Product
	18-DEC-90	NS	NS	NS	NS	NS	0.42' Free Product
	28-MAR-91	NS	NS	NS	NS	NS	0.28' Petroleum
MW-4	05-DEC-88	ND(2.0)	ND(2.0)	2.3	6.5	4500	
	08-MAR-89	ND(9.0)	ND(8.0)	ND(10)	ND(10)	3900	
	22-JUN-89	ND(0.4)	ND(0.4)	ND(0.5)	ND(0.8)	1500	
	27-SEP-89	11	ND(1)	ND(1)	ND(4)	1200	
	29-DEC-89	ND(1)	2.1	2.3	ND(3)	920	
	29-MAR-90	ND(0.6)	ND(0.9)	8.0	ND(3)	870	
	21-JUN-90	ND(5)	ND(5)	ND(6)	ND(20)	1500	
	25-SEP-90	ND(0.5)	11	4.6	6.0	3100	
	18-DEC-90	ND(0.5)	4.4	15	6.3	3600	
	28-MAR-91	8.9	4.4	4.4	2.2	2000	
MW-5	05-DEC-88	ND(0.2)	0.78	0.23	0.92	3.9	
	08-MAR-89	2.7	6.7	2.7	15	58	
	22-JUN-89	0.91	ND(0.1)	ND(0.1)	ND(0.3)	5.0	
	27-SEP-89	1.3	ND(0.1)	ND(0.1)	ND(0.4)	5.3	
	29-DEC-89	ND(0.5)	ND(0.5)	ND(0.5)	ND(2)	ND(5)	
	29-MAR-90	ND(1)	ND(0.5)	ND(0.5)	ND(2)	ND(5)	
	21-JUN-90	ND(0.7)	ND(0.6)	ND(0.7)	ND(2)	12	
	25-SEP-90	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(20)	
	18-DEC-90	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(50)	
	28-MAR-91	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(50)	
MW-6	05-DEC-88	4.0	1.3	0.63	1.3	190	
	08-MAR-89	2.2	ND(0.4)	ND(0.5)	1.1	23	
	22-JUN-89	0.82	2.6	0.18	1.2	57	
	27-SEP-89	0.2	0.24	ND(0.1)	ND(0.4)	2.1	
	29-DEC-89	ND(0.5)	ND(0.5)	ND(0.5)	ND(2)	ND(5)	
	29-MAR-90	2.1	ND(0.5)	ND(0.5)	ND(2)	12	
	21-JUN-90	ND(0.7)	ND(0.6)	ND(0.7)	ND(2)	ND(5)	
	25-SEP-90	1.4	ND(0.5)	ND(0.5)	ND(0.5)	98	
	18-DEC-90	2.2	ND(0.5)	ND(0.5)	ND(0.5)	200	
	28-MAR-91	0.5	ND(0.5)	ND(0.5)	ND(0.5)	140	

WELL ID	DATE SAMPLED	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYLBENZENE (ug/L)	XYLENES (ug/L)	TPH-G (ug/L)	COMMENTS
MW-7	05-DEC-88	140	150	40	370	1500	
	08-MAR-89	730	72	180	370	2400	
	22-JUN-89	570	43	180	220	2000	
	27-SEP-89	420	5.9	140	28	1400	
	29-DEC-89	87	3.5	18	15	150	
	29-MAR-90	110	40	53	150	530	
	21-JUN-90	620	34	290	400	4100	
	25-SEP-90	49	2.4	30	42	750	
	18-DEC-90	74	4.5	25	69	510	
	28-MAR-91	58	0.8	24	24	500	
MW-8	27-SEP-89	ND(1)	ND(1)	16	ND(1)	4200	
	29-DEC-89	ND(1)	3.2	18	ND(3)	2800	
	29-MAR-90	ND(6)	ND(9)	19	ND(30)	2600	
	21-JUN-90	ND(2)	ND(2)	13	ND(6)	4600	
	25-SEP-90	2.3	22	16	26	4500	
	18-DEC-90	0.7	6.0	9.7	2.3	1100	
	28-MAR-91	2.6	4.6	3.2	3.1	1600	*
MW-9	27-SEP-89	ND(0.1)	ND(0.1)	ND(1)	ND(0.4)	25	
	29-DEC-89	ND(0.5)	ND(0.5)	ND(0.5)	2.5	11	
	29-MAR-90	ND(0.5)	ND(0.5)	ND(0.5)	ND(2)	ND(5)	
	21-JUN-90	ND(0.5)	ND(0.5)	ND(0.6)	ND(2)	ND(5)	
	25-SEP-90	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(20)	
	18-DEC-90	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	100	
	28-MAR-91	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(50)	

NOTES:
1) TPH-G = Total Petroleum Hydrocarbons-as-Gasoline.
2) ND = Not detected, detection limit above in parentheses.
3) Odor refers to petroleum hydrocarbon odor.
4) All results are presented in parts per billion.
5) Samples prior to December 1988 taken by Applied GeoSystems.
6) Samples from December 1988 through December 1990 taken by DuPont Environmental.
7) NS = Not Sampled.



U.S.G.S. 7.5 MIN. HAYWARD, CA.
QUADRANGLE

FIGURE 1
SITE LOCATION MAP

202/899-7072
ULTRAMAR INC.
44 LEWELLING BLVD.
SAN LORENZO, CA. 2/25/91

0 MILES 1

GROUNDWATER TECHNOLOGY, INC.

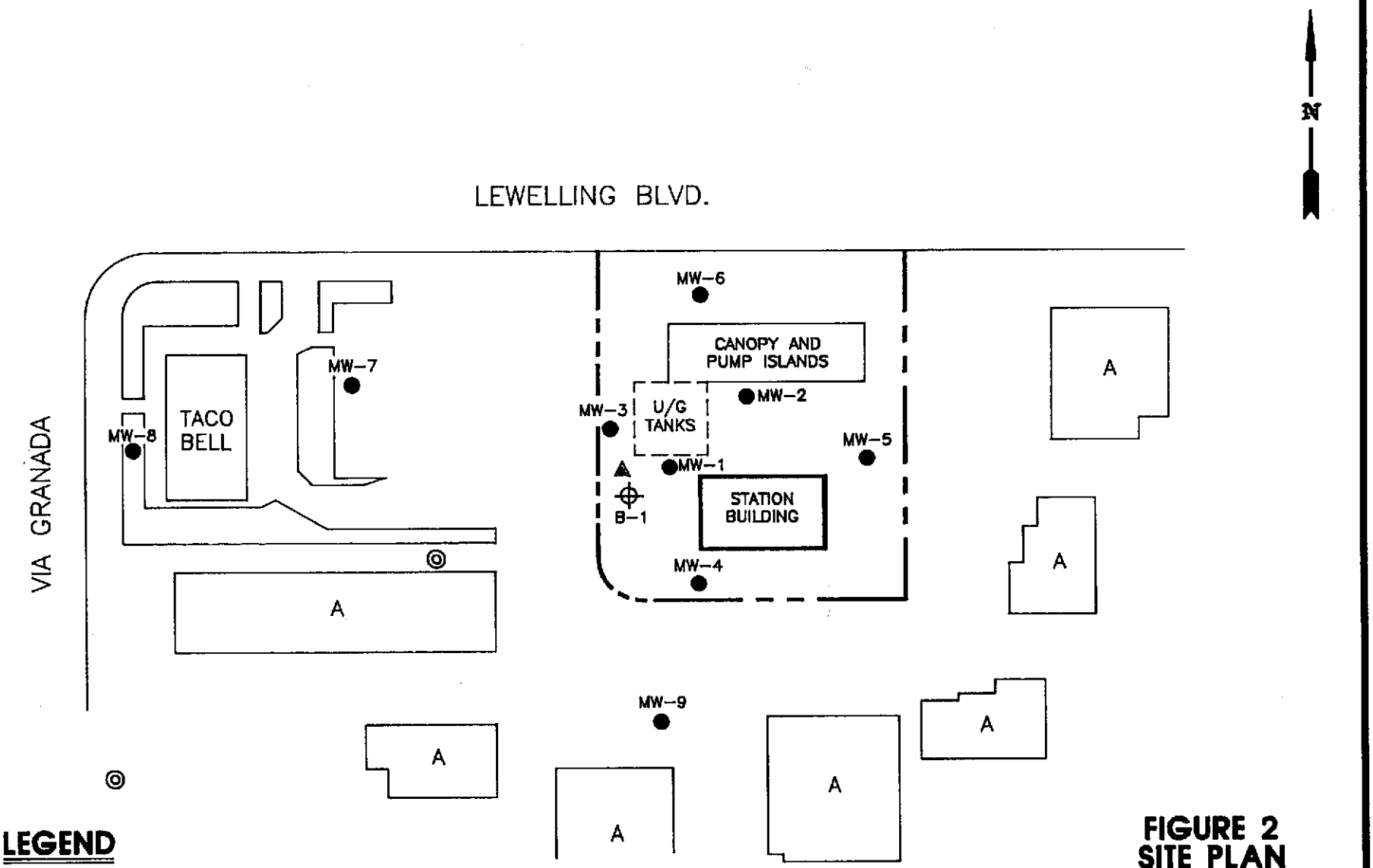
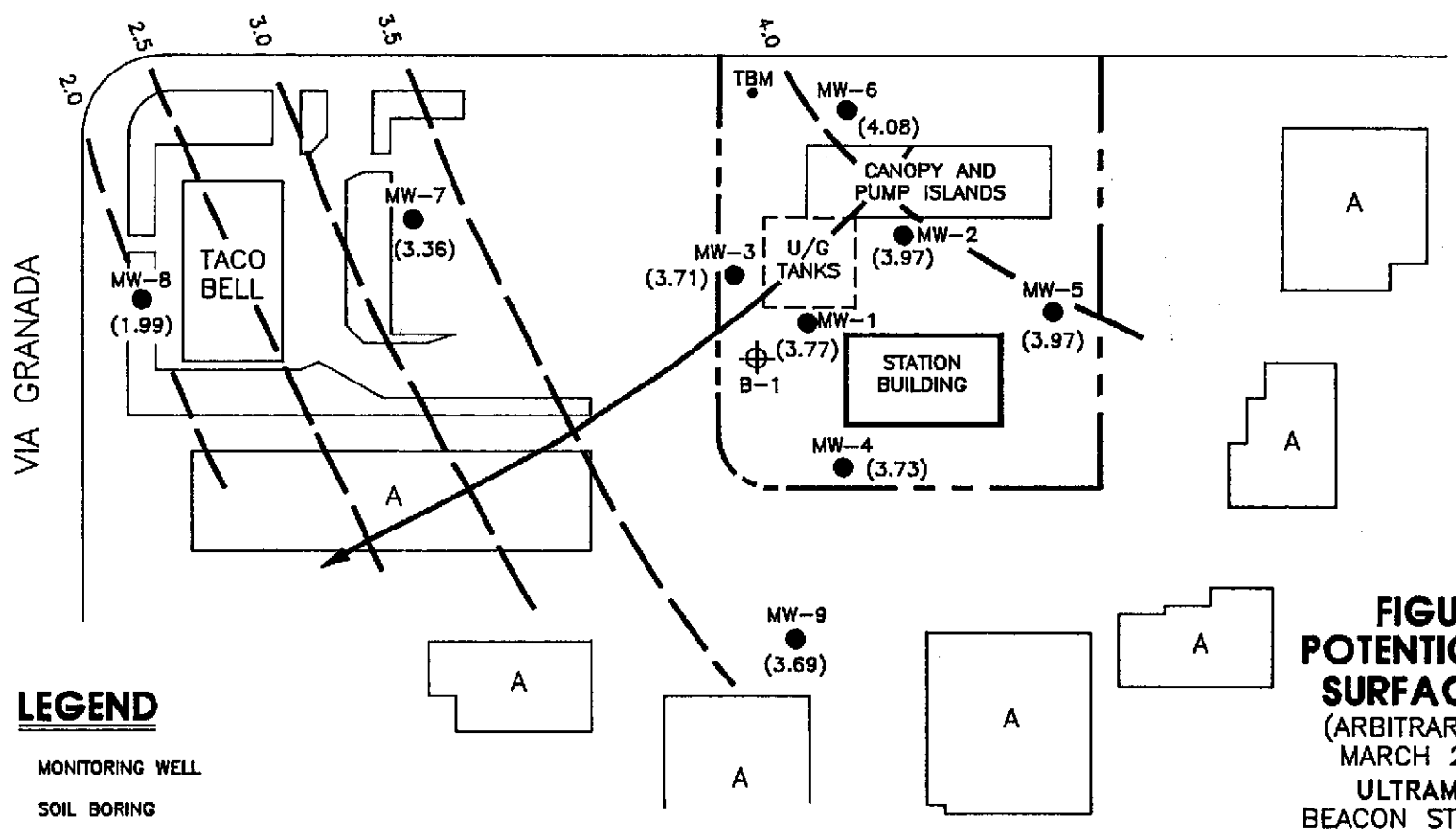


FIGURE 2
SITE PLAN

ULTRAMAR INC.
BEACON STATION #721
44 LEWELLING BLVD.
SAN LORENZO, CA.
202/899-7072

GROUNDWATER TECHNOLOGY, INC.



N

LEGEND

- MONITORING WELL
- SOIL BORING
- A — APARTMENT BLDGS.
- TBM — TEMPORARY BENCH MARK =20 FT.
- (3.69) — POTENTIOMETRIC SURFACE ELEVATION (FT.)
- POTENTIOMETRIC SURFACE CONTOUR; INTERVAL=0.5 FT.
- ESTIMATED GROUNDWATER FLOW DIRECTION

REVISIONS:
DATE: 4/17/91
REVISION: FINAL DRAFT
BY: GWS

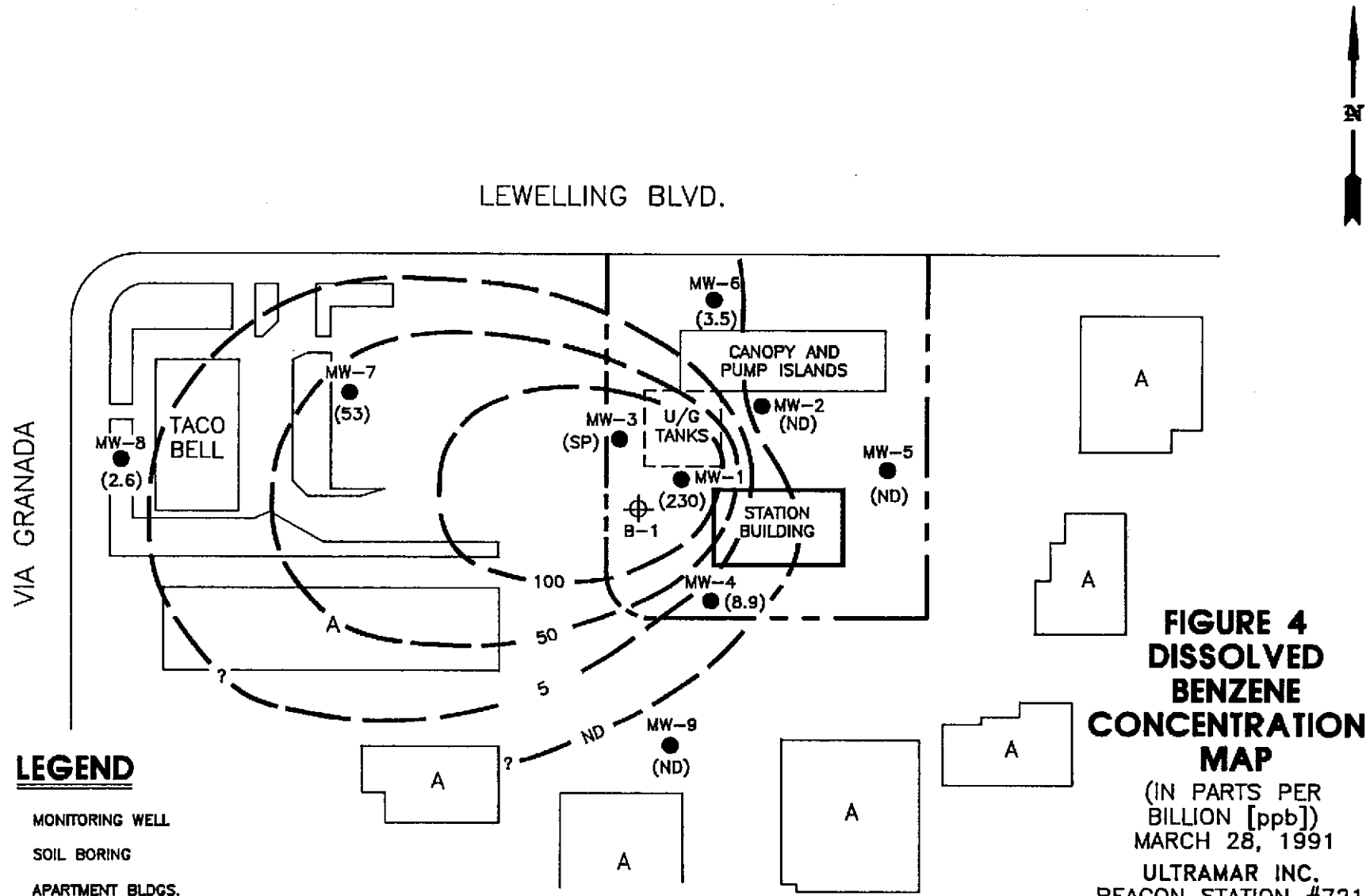
0 50'
APPROX. SCALE

FIGURE 3
POTENTIOMETRIC SURFACE MAP

(ARBITRARY DATUM)
MARCH 28, 1991

ULTRAMAR INC.
BEACON STATION #721
44 LEWELLING BLVD.
SAN LORENZO, CA.
02320-1009

GROUNDWATER TECHNOLOGY, INC.



LEGEND

- ● MONITORING WELL
- ⊕ SOIL BORING
- A APARTMENT BLDGS.
- (230) DISSOLVED BENZENE CONCENTRATION (ppb)
- (SP) SEPARATE-PHASE PETROLEUM HYDROCARBONS
- (ND) NOT DETECTABLE AT OR ABOVE METHOD DETECTION LIMIT
- ⌒ LINE OF ESTIMATED EQUAL DISSOLVED BENZENE CONCENTRATION (ppb)

FIGURE 4
DISSOLVED BENZENE CONCENTRATION MAP

(IN PARTS PER BILLION [ppb])
MARCH 28, 1991

ULTRAMAR INC.
BEACON STATION #721
44 LEWELLING BLVD.
SAN LORENZO, CA.
02320-1009

REVISIONS:
DATE: 4/17/91
REVISION: FINAL DRAFT
BY: GWS

0 50'
APPROX. SCALE

GROUNDWATER TECHNOLOGY, INC.

ATTACHMENT I

WELL MONITORING FORM

GROUNDWATER TECHNOLOGY, INC.

WELL MONITORING FORM

Project: BEACON STATION #721
Location: SAN LORENZO, CALIFORNIA
Date: 03-28-91
Operator: P. Lamb
Method: Interface Probe
Equipment #:

WELL ID	WELL DEPTH (feet)	GRADE ELEV. (feet)	DEPTH to WATER (feet)	DEPTH to PETRO (feet)	PETRO THICK (feet)	PETRO GRAV	HYDRO EQUIV (feet)	CORR DTW (feet)	CORR WAT ELEV (feet)
MW-1	35.00	21.54	17.77	NA	NA		NA	17.77	3.77
MW-2	35.00	20.91	16.94	NA	NA		NA	16.94	3.97
MW-3	35.00	20.96	17.45	17.20	0.25	0.80	0.20	17.25	3.71
MW-4	25.00	22.52	18.79	NA	NA		NA	18.79	3.73
MW-5	30.00	21.66	17.69	NA	NA		NA	17.69	3.97
MW-6	30.00	20.37	16.29	NA	NA		NA	16.29	4.08
MW-7	25.50	19.40	16.04	NA	NA		NA	16.04	3.36
MW-8	22.00	19.13	17.14	NA	NA		NA	17.14	1.99
MW-9	24.00	22.82	19.13	NA	NA		NA	19.13	3.69

Notes:
NA = Not Applicable

ATTACHMENT II

ANALYTICAL LABORATORY REPORTS

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

1020lab.frm

Attention:	Mr. Robert Bird	Date Sampled:	03-28-91
	Groundwater Technology Inc.	Date Received:	03-29-91
	1404 Halyard Dr., Suite 140	BTEX Analyzed:	04-08-91
	West Sacramento, CA 95691	TPHg Analyzed:	04-08-91
Project:	AGS 19505-L, Project #202-899-7072	TPHd Analyzed:	NR
	Station #721, San Lorenzo	Matrix:	Water

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppb	ppb	ppb	ppb	ppb	ppb
Detection Limit:	0.5	0.5	0.5	0.5	50	100
SAMPLE Laboratory Identification						
MW-5 W1103784	ND	ND	ND	ND	ND	NR
MW-9 W1103786	ND	ND	ND	ND	ND	NR
MW-6 W1103788	3.5	ND	ND	ND	140	NR
MW-2 W1103790	ND	2.2	2.7	1.1	730	NR
MW-8B W1103791	ND	0.6	ND	ND	ND	NR

ppb = parts per billion = $\mu g/L$ = micrograms per liter.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

April 11, 1991
Date Reported

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

1020lab.frm

Attention: Mr. Robert Bird
Groundwater Technology Inc.
1404 Halyard Dr., Suite 140
West Sacramento, CA 95691
Project: AGS 19505-L, Project #202-899-7072
Station #721, San Lorenzo

Date Sampled: 03-28-91
Date Received: 03-29-91
BTEX Analyzed: 04-08-91
TPHg Analyzed: 04-08-91
TPHd Analyzed: NR
Matrix: Water

	Benzene ppb	Toluene ppb	Ethyl-benzene ppb	Total Xylenes ppb	TPHg ppb	TPHd ppb
Detection Limit:	0.5	0.5	0.5	0.5	50	100
SAMPLE Laboratory Identification						
MW-8 W1103792	2.6	4.6	3.2	3.1	1600	NR
MW-7 W1103794	53	0.8	24	24	500	NR
MW-4 W1103796	8.9	4.4	4.4	2.2	2000	NR
MW-1 W1103798	230	75	570	2000	26000	NR

ppb = parts per billion = µg/L = micrograms per liter.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

ANALYTICAL PROCEDURES

BTEX-- Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg--Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd--Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

April 10, 1991
Date Reported

APPLIED ANALYTICAL LABORATORY IS CERTIFIED BY THE STATE OF CALIFORNIA DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY
(Certification No. 1211)

Ultramar Inc.
CHAIN OF CUSTODY REPORT

BEACON

9139.1

Beacon Station No.	Sampler (Print Name)			ANALYSES								Date	Form No.
721	B. Sieminski / P. Lamb											03/28/91	1 of 3
Project No.	Sampler (Signature)												
202-899-7072	B. Sieminski												
Project Location San Lorenzo	Affiliation												
44 Lewelling Boulevard	GTI												
Sample No./Identification	Date	Time	Lab No.	BTEX	TPH (gasoline)	TPH (diesel)					No. of Containers	REMARKS	
SB	03/28/91	1130		X	X						1	hold	
MW-5B		1135		X	X						1	hold	
MW-5		1140		X	X						2		
MW-9B		1145		X	X						1	hold	
MW-9		1150		X	X						2		
MW-6B		1155		X	X						1	hold	
MW-6		200		X	X						2		
MW-2B		205		X	X						1	hold	

Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
B. Sieminski GTI	03/29	900	GTI	3/29	9:05
GTI	3/29	11:45	T Watson Priority	3/29	1145
			Anthony Guerra - Applied Analytical	3/29	3:45

Report To: Bob Bird
Groundwater Technology Inc.
1401 Halyard Dr. Suite 140W
West Sacramento, CA 95691

Bill to: ULTRAMAR INC.
525 West Third Street
Hanford, CA 93230
Attention: Terry Fox

WHITE: Return to Client with Report YELLOW: Laboratory Copy PINK: Originator Copy

32-8003 1/90

Ultramar Inc.
CHAIN OF CUSTODY REPORT

BEACON

Beacon Station No.	Sampler (Print Name)			ANALYSES								Date	Form No.
721	B. Siemiński / P. Lamb											03/28/91	2 of 3
Project No.	Sampler (Signature)												
202-899-7072	B. Siemiński												
Project Location	Affiliation												
44 Lewelling Boulevard San Lorenzo	GTI												
Sample No./Identification	Date	Time	Lab No.	BTEX	TPH (gasoline)	TPH (diesel)					No. of Containers	REMARKS	
MW-2	03/28/91	2^10		X	X						2		
MW-8B	"	2^15		X	X						1	"	
MW-8		2^20		X	X						2		
MW-7B		2^25		X	X						1	hold	
MW-7		2^30		X	X						2		
MW-4B		2^35		X	X						1	hold	
MW-4		2^40		X	X						2		
MW-1B		2^45		X	X						1	hold	

Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
B. Siemiński GTI	03/29	905	[signature] GTI	3/29	9:05
[signature] GTI	3/29	11:45	[signature] Precisely	3/29	11:45
			[signature] Applied Analytical	3/29	3:45

Report To: Bob Bird
Groundwater Technology Inc
1401 Halyard Dr. Suite 140
West Sacramento, CA 95691

Bill to: ULTRAMAR INC.
525 West Third Street
Hanford, CA 93230
Attention: Terry Fox

WHITE: Return to Client with Report YELLOW: Laboratory Copy PINK: Originator Copy

32-8003 1/90

Ultramar Inc.
CHAIN OF CUSTODY REPORT

BEACON

Beacon Station No.	Sampler (Print Name)			ANALYSES									Date	Form No.
7.21	B. Sieminski / P. Lamb												03/28/91	3 of 3
Project No.	Sampler (Signature)													
202-899-7072	B. Sieminski													
Project Location	Affiliation													
44 Lewelling Blvd. San Lorenzo	GTI													
Sample No./Identification	Date	Time	Lab No.	BTEX	TPH (gasoline)	TPH (diesel)						No. of Containers	REMARKS	
MW-1	03/28/91	2:50		X	X							2		

Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
B. Sieminski GTI	03/29	9:00	[signature] GTI	3/29	9:05
[signature] GTI	3/29	11:45	[signature] Pioneer	3/29	11:45
			Anthony Mei - Applied Analytical	3/29	3:45

Report To: Bob Bird
Groundwater Technology Inc.
1401 Halyard Dr. Suite 140W
West Sacramento, CA 95691

Bill to: ULTRAMAR INC.
525 West Third Street
Hanford, CA 93230
Attention: Terry Fox

WHITE: Return to Client with Report YELLOW: Laboratory Copy PINK: Originator Copy

32 8003 1/90

ATTACHMENT III

STANDARD OPERATING PROCEDURES

13.0 Well Gauging with ORS Interface Probe

13.1 Purpose

Obtaining consistent and accurate well gauging data is a critical part of each project. The well gauging data collected at each site provide a long-term record of: the seasonal groundwater fluctuations at a site; the presence, location, and thickness of measurable amounts of free-phase hydrocarbons; and, the effectiveness of recovery well operations.

13.2 Equipment

- Interface probe
- Monitoring Form
- Monitoring/Sampling Record Form
- Roadway box key or channel lock wrench
- Keys
- Bailer
- Rags; probe wipers
- Alconox solution and distilled water
- Site plan
- Previous well gaugings

13.3 Procedure

13.3.1 Check the interface probe to see that it is functioning properly before departure.

13.3.2 Familiarize yourself with the way the interface probe works. A beeping tone indicates water and a solid tone indicates a fluid other than water. To avoid spark hazard, attach the E.I.P. grounding clamp to the metal casing prior to gauging.

13.3.3 At sites with free-phase petroleum, arrange to bail the petroleum from the wells 24 - 48 hours prior to gauging all of the wells. Be consistent and establish a routine. Bailing the accumulated petroleum from the wells is done in an effort to obtain an accurate measurement of the amount of petroleum in the formation surrounding the well. Dispose of the bailed petroleum following Disposal of Gasoline Procedure.

13.3.4 Inform appropriate parties (such as the station manager) of your arrival at the site and the purpose of your visit.

13.3.5 If possible, gauge cleaner wells first to avoid cross-contamination.

13.3.6 Gauging should be obtained to the surveyed point. If you do not know where that point is, ask the Project Manager. Generally, the survey point will be marked with paint or marker. If you cannot determine where the mark is, take measurements from the highest point on the well casing, the lip of the roadway box and the top of the roadway box. Make a notation as to which gaugings were taken from which reference point. (For example: DTW 10.0' from top of PVC; DTW 10.3' from top of road box lip.) It is extremely important to measure to the same point each time a well is gauged.

13.3.7 If a probe is missing any footage from the tape, make a notation on the gauging form. (For example: Subtract 1 ft. from all gaugings.) Read the measurements directly from the tape. The data will be corrected when it is entered into the computer. Record the probe I.D. number.

13.3.8 Compare current gaugings to previous gaugings.

13.3.9 Note any unusual occurrences such as bacterial buildup on equipment. At sites where recovery wells, air strippers, soil vent systems, etc. are in operation check to see that the equipment is running normally.

13.3.10 It is important to keep probes clean and free of dirt. Always clean probe tape before reeling it back into the housing. Use a rag and probe wiper.

13.3.11 When petroleum is detected in a well, confirm the reading with a bailer. Note the color and clarity of the petroleum on the gauging form. Bail the petroleum from the well and store the bailed petroleum in the product storage tank at the site. (Do not dispose in facility waste oil tank.)

13.3.12 If petroleum is detected in a well where petroleum has not been detected before or has not been detected in several gaugings, verify the reading with a bailer. Communicate this to the Project Manager when you call the office.

13.3.13 If a petroleum storage tank is in use at the site, gauge the DTW and DTP in the tank. Mark the gauging accordingly on the monitoring form. Notify the Project Manager when the tank is getting full.

13.3.14 WRITE DOWN EVERYTHING YOU SEE OR DO! (No matter how hard you try, you cannot remember everything you did at a site when you are back at the office.)

13.3.15 Complete all paper work (monitoring forms, monitoring/sampling record form) with all notes as to events that occurred while you were at the site. Do not forget to note the weather, temperature, operation of equipment, the number of the probe used, whether water samples were obtained and from where, etc. If you are questioned by the client or by representatives from the state and/or town where the site is located, note the name and the affiliation of the person, the questions asked, and the answers given.

13.3.16 Call the project manager prior to leaving the site. Under no circumstances leave the site without talking to someone at the office if you encounter problems such as equipment failure.

13.3.17 When you return to the office, submit all paper work to the Project Manager.

14.0 Reduction of Well Gauging Data

14.1 Purpose

To correct for the presence of hydrocarbons floating on the water table surface.

14.2 Procedure

14.2.1 See Well Monitoring Form Example.

14.2.2 See Corrected Water Table Schematic.

14.2.3 The following information is required in order to reduce the gauging data collected in the field:
- T.O.C. elevation - the survey point from which the gauging is measured
- depth to water (DTW)
- depth to petroleum (DTP)
- petroleum gravity

14.2.4 To determine the petroleum thickness, subtract DTP from DTW.
ex: 20.97 ft - 19.01 ft = 1.96 ft

14.2.5 To determine the hydraulic equivalent, multiply the petroleum thickness by the petroleum gravity.
ex. 1.96 ft x 0.88 = 1.72 ft

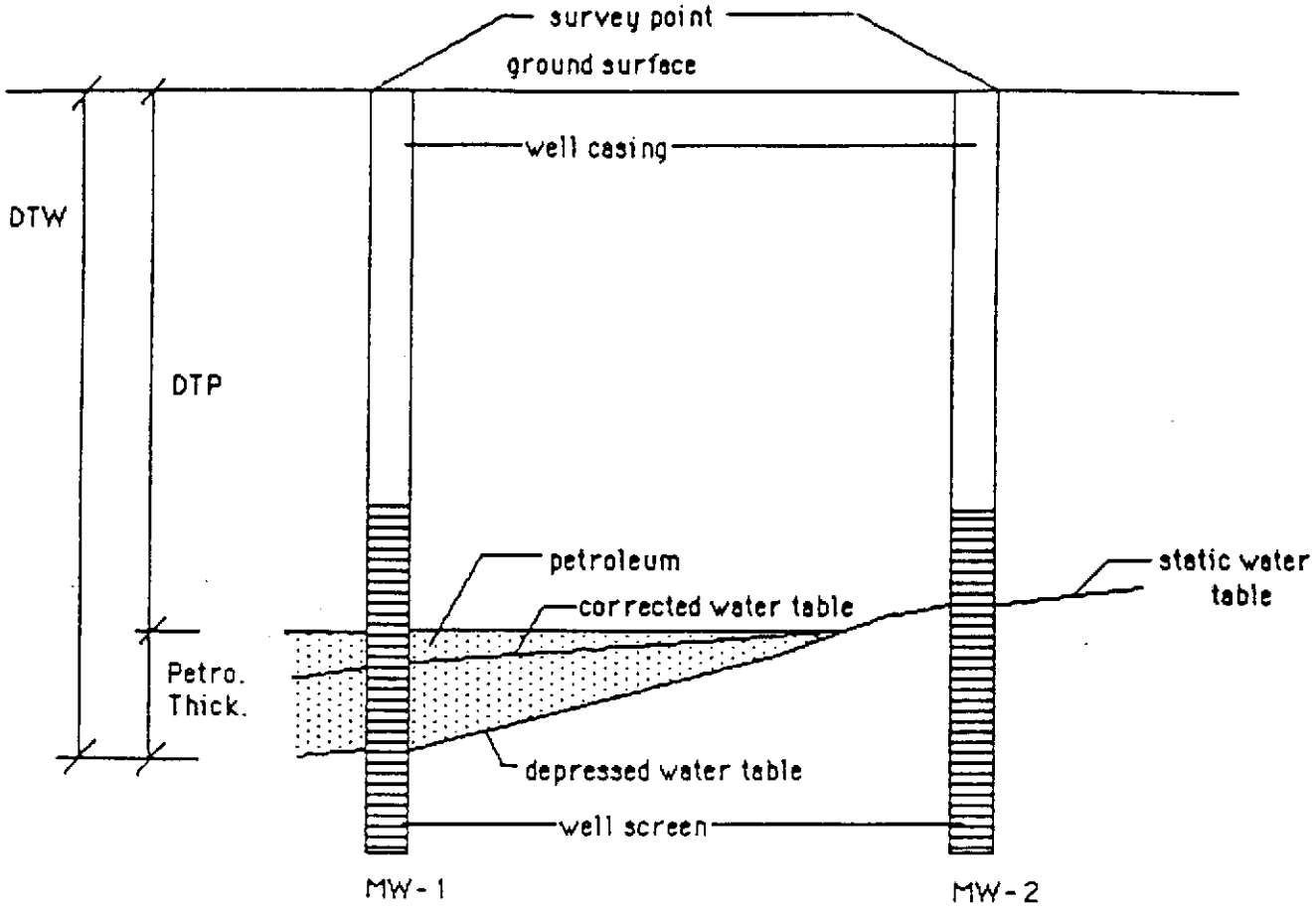
14.2.6 To determine the corrected depth to water (CDTW), subtract the hydraulic equivalent from the original DTW.
ex. 20.97 ft - 1.72 ft = 19.25 ft

14.2.7 To determine the corrected water elevation, subtract the CDTW from the T.O.C. elevation.
ex. 224.00 ft - 19.25 ft = 204.75 ft

14.2.8 Referring to the variables on the example monitoring form:

F = Petroleum thickness = D - E
H = Hydraulic Equivalent = F x G
I = Corrected DTW = D - H
J = Corrected Water Elevation = C - I

CORRECTED WATER TABLE SCHEMATIC



Petroleum Thickness = DTW - DTP

Hydro. Equiv. = Petroleum Thickness x Petroleum Gravity

Corrected DTW = DTW - Hydro. Equiv.

Corrected Water Elevation = T.O.C. - Corrected DTW

16.0 Water Quality Sampling

16.1 Purpose

Water quality samples are taken to establish the water quality at each sampling point and to obtain bacteriological information as part of a bioremediation program. Special care must be taken to ensure that the sample taken from a well is representative of the water at that location and that the sample is not altered or contaminated by the sampling and handling procedure. The procedures for obtaining and handling water quality samples differ depending on the type of analysis required. Standard water quality analyses for volatile organic compounds (VOC) are EPA Analytical Methods 601, 602, and 624. The standard analysis for semi-volatile organics is EPA Analytical Method 625. Bacterial analyses for a bioremediation program can be obtained by standard plating, membrane plating, and fermentation inoculum.

16.2 References

Driscoll, Fletcher G., Ph.D., 1986, "Groundwater and Wells", Second Edition, Johnson Division, St. Paul, Minnesota.

Scalf, Marion R., McNabb, James F., Dunlap, William J., Cosby, Roger L., Fryberger, John, 1981, "Manual of Ground-Water Sampling Procedures", Robert S. Kerr Environmental Research Laboratory, U.S. Environmental Protection Agency, Ada, Oklahoma.

U.S. EPA, 1977, "Procedures Manual for Ground Water Monitoring at Solid Waste Disposal Facilities", SW-611, U.S. EPA, Cincinnati, Ohio.

16.3 Procedure

16.3.1 Water samples should not be taken from the stagnant water in the well.

16.3.2 Water samples should be taken in triplicate.

16.3.3 Remove 3 to 5 volumes of water in the well prior to sampling. The water may be removed by bailing, submersible pump, or purge system. Wells with a slow recovery period should be bailed dry and then sampled within 1 hour or

when recovered to 50%. Monitor pH, temperature and specific conductivity with each well volume to insure water quality stabilization has occurred. However, this is not necessary at every well or in all circumstances.

16.3.4 Use only Teflon, stainless steel, or glass bailers to obtain the sample. Use Teflon, only, for sampling water containing chlorinated compounds and also for bacteriological samples. PVC bailers can be used for one-time sampling for other than EPA 624 analysis. Using a bailer for a one-time sampling reduces the possibility for cross-contamination.

16.3.5 When sampling, avoid stirring up any sediments in the well.

16.3.6 All sampling equipment must be cleaned following the appropriate procedure to avoid cross contamination from site to site and sample to sample. The sampling equipment should be cleaned before each well sampling, between each sampling, and at the end of each sampling round.

16.3.7 Monitoring wells should be gauged prior to sampling.

16.3.8 If possible, the monitoring wells should be sampled starting with the cleanest well and ending with the most contaminated well.

16.3.9 Wells containing free-phase contaminants should not be sampled.

16.3.10 When filling out the chain of custody form:
- enter the samples in the order in which they were collected;
- make a note as to the cleaning fluid used to clean the sampling equipment;
- attempt to identify which samples are the most contaminated;
- complete all other requested information.

16.3.11 The laboratory sample identification label should be filled out with a waterproof pen and firmly affixed to each sample container.

Typically, identification labels require that the following information be supplied:
- job name
- job number
- sampler's name
- date
- sample identification (ex: MW-1)
- date sampled (time is sometimes requested, too)
- analysis requested

16.3.12 Acidification is required for samples that will by analyzed by the EPA 624 method. (see Acidification Procedure in this section)

16.3.13 Acidification is recommended for EPA method 601 and 602 samples to preserve them and increase their holding life. (see Acidification Procedure in this section)

16.3.14 Field blanks should be taken as part of each sampling round. A field blank consists of a sample of distilled water which has been collected by putting the distilled water into a sampling bailer after the bailer has been cleaned following the procedure used to clean that bailer during the sampling round. The field blank is stored with the samples. It is not analyzed unless requested by the Project Manager.

16.3.15 Handling of decontaminated equipment:

- Always use "pristine" gloves (latex, solvex, etc.).
- Place decontaminated bailers on clean surface (plastic).
- Do not wipe down bailer with paper towels or cloth. Follow decontamination procedure.

16.4 Cautions

16.4.1 Sample accuracy can be adversely affected by the entrainment of sediment in wells which have not been properly developed. Contaminants adhering to the sediments can be released when samples are acidified for preservation.

Therefore, when sampling for inorganics (metals), field filtering of the samples is recommended.

16.4.2 Chemical changes can take place because the sample was oxidized during sampling. It is critical to avoid oxidation of samples when sampling for VOC.

16.4.3 All samples should be properly and promptly preserved.

16.4.4 All samples should be analyzed quickly; arrangements should be made with the testing laboratory to insure prompt analysis.

16.4.5 Bailer strings that have contacted water or contaminants should be replaced between each well to avoid contamination from a bailer string which has absorbed contamination. A good practice would be to replace the strings of both the evacuation and sampling bailers at the start of each sampling round, and in some instances, between wells. Caution: some bailer strings are treated with a fungicide which may be detected in priority pollutant analysis.

16.4.6 Notify laboratory that samples are being shipped in advance of sampling to insure proper delivery and turnaround.

16.4.7 On Chain of Custody, note what type of decontamination or preservation fluids, chemicals were used.

16.5 Acidification Procedure

16.5.1 At the start of each sampling round, the amount of acid required to lower a sampling container of water to be sampled to a pH of less than 2 should be determined.

16.5.2 After removing 3 to 5 well volumes from the first well to be sampled, put 5-10 drops of 50% HCL into a 40 ml sample vial (larger sampling containers will require more acid) and fill the vial with water from the well; determine the pH of the water in the vial with the pH paper; if

the pH is too high, repeat the procedure using 15-20 drops of acid in the vial; repeat until the pH of the water in the sample vial is a pH of less than 2 on the pH paper; note the amount of acid required to lower the pH of the volume of water in the sampling vial. (pH paper should not be placed into sampling container. Pour sample onto pH paper to check for proper pH.)

16.5.3 Discard the practice acidified sample.

16.5.4 Once the amount of acid required to reach a pH of <2 is known, the acid can be routinely added to each sample container directly; the water to be analyzed is added to vial or container containing the appropriate amount of acid.

16.5.5 Note that the amount of acid required is site specific and should be noted on the Chain of Custody form.

16.5.6 The procedure should be repeated at each site at the start of each sampling round.

16.6 EPA Analytical Methods 601, 602, and 624 Sampling Procedures

16.6.1 Equipment

- Bailer or other means to remove 3 to 5 well volumes
- Sampling bailer
- Polyethylene squirt bottle of 50% hydrochloric (HCL) acid
- Narrow range pH paper (1.0 - 2.5 pH range)
- Paper towels
- Waterproof pen
- Laboratory sample identification labels
- Cooler with ice
- Chain of custody forms
- Sample containers (usually 40 ml glass vials with teflon faced septums)
- Alconox solution and/or methanol
- Distilled water
- Safety equipment (gloves, etc.)
- Dissolved oxygen meter (sometimes used in limited biorec projects in conjunction with bacteriological testing)

- pH, temperature and conductivity meter
- Site map with well locations
- Site Sampling Plan (QAPP)

16.6.2 All sampling equipment will be cleaned by washing thoroughly with alconox solution or methanol and rinsed with distilled water; this procedure should be repeated three times. When sampling for metals, the sampling equipment should be acid washed. Other cleaning techniques may be required, depending on the testing requirements and chemicals in question (check with the Laboratory).

16.6.3 Carefully remove five bailerfulls of water from the well using the sample bailer before retaining the sample from the fifth bailer; this thoroughly rinses the sample bailer with the water to be sampled helping to insure a representative sample and to reduce cross contamination.

16.6.4 Thoroughly rinse the sample containers with the water to be sampled.

16.6.5 If the samples are to be acidified, add acid to the sample containers (EPA method 624 requires acidification).

16.6.6 Fill two sample containers with the contents of the sampling bailer.

16.6.7 BE CAREFUL not to touch the rim of the sample container or the sample container top with your fingers or with the bailer.

16.6.8 DO NOT pour the sample from the sample bailer over the bailer cord; do not allow the cord to touch the sample container.

16.6.9 Avoid aeration of the sample during transfer of the water from the bailer to the sample container in order to reduce the possibility of oxidation of the sample; gently and carefully pour the sample into the sample container in a steady stream.

16.6.10 The sample should contain no air; fill the sample container to the top so that a meniscus

is formed; wait for any bubbles to rise to the surface; carefully and quickly slip the cap of the sampling container onto the container and tighten securely.

16.6.11 Invert the sample and tap it gently against the heal of your hand; look for any air bubbles; if the sample contains air bubbles, discard the sample and repeat the sampling process with new sampling containers.

16.6.12 Obtain duplicate and triplicate samples from the same well following the same procedure.

16.6.13 Affix the laboratory sample identification labels.

16.6.14 Place samples in cooler with ice.

16.6.15 Complete the chain of custody form.

16.7 EPA Analytical Method 625

16.7.1 The procedure for sampling for EPA 625 is the same as for EPA 601, 602, and 624.

16.7.2 The sample container size is a 1-liter glass sample container.

16.7.3 DO NOT acidify EPA 625 samples.

16.8 Bacteriological Sampling

16.8.1 Refer to "Handbook of Bioremediation" prepared by Groundwater Technology, Inc., Chadds Ford, PA.

16.8.2 Sampling for an initial feasibility sampling should have the goal of assessing the total water ecology of the impacted area; the following parameters should be determined:

- water temperature
- dissolved oxygen
- total dissolved solids (TDS)
- pH
- conductivity
- inorganic chemistry
- organic chemistry
- microbiology